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HIV Prevalence and Associated Factors among Female Mobile HIV Counseling and Testing Acceptors in 40 Towns of Ethiopia

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Acronyms

AIDS: Acquired Immune Deficiency Syndrome

CDC: Center for Disease Control

CSA: Central Statistical Agency

CT: Counseling and Testing

DHS: Demographic and Health Survey

FHI: Family Health International

GAMET: Global HIV/AIDS Monitoring and Evaluation Team

HCT: HIV Counseling and Testing

HIV: Human Immunodeficiency Virus

MHCT: Mobile HIV Counseling and Testing

MOE: Ministry of Education

MOH: Ministry of Health

PMTCT: Prevention of Mother to Child Transmission

TB: Tuberculosis

UNAIDS: United Nation Program on HIV/AIDS

UNESCO: United Nations Educational Scientific and Cultural Organization

USAID: United States Agency for International Development

VCT: Voluntary Counseling and Testing

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Abstract

Background

Large proportions of women are exposed to risk of HIV infection due to a number of factors and also different strategies are identified to address those at risk population groups, HIV counseling and testing is one of the entry points of prevention and mitigation programs. But in spite of the effort HIV remains one of the major public health problems of the country. .

Objective

The general objective of the study is to assess HIV test result and its determinants among women clients of the mobile HCT service.

Methodology

This is a descriptive study which is conducted 40 towns of Ethiopia for the period July, 2007 and November,2008. The data were routinely collected by the service providers. Descriptive and multivariate analyses were performed to determine HIV prevalence and its determinants respectively.

Result and Discussion

The overall HIV prevalence among mobile counseling and testing women clients was 8.53%.for all Clients, aged 25 – 29 [AOR=3.1, CI 2.4 – 4.0], widowed clients [AOR=2.9 CI 2.3 – 3.6], clients who reached to primary level of education [AOR=2.1, CI 1.4 – 3.0], commercial sex worker[AOR=8.1, CI 5.8 – 13.8], binge sexually active[AOR=2.2, CI 1.8 – 3.5], are the major determinants of HIV infection among all female clients.

Conclusion and recommendation

Females HIV status is determinants are age group 25 – 39 , widowed, separated and divorced, lower level of education, being a commercial sex worker, history of STI and those who are making life by petty trading, tella and areke selling at greater risk. The prevention strategies should focus on this segment of the female population. In addition to this targeted behavioral change communication strategies should be developed. I recommend that the existing different HIV Counseling and testing modalities should focus to reach key population groups.

1. Introduction

The HIV/AIDS crisis is one of the greatest human challenges of our time. HIV has reduced life expectancy of highly affected countries by more than 20 years and slowed economic growth of many countries (1). HIV/AIDS is inextricably linked to poverty and erodes hard-won livelihoods of the world poorest communities. It contributes to hunger, wipes out years of socio-economic progress and has disastrous financial effect on families.

Despite a recent stabilization of the global HIV/AIDS (1), the pandemic continues to expand; we haven't reached the limit yet. HIV/AIDS is the first cause of death in Africa and the fourth cause of death worldwide. In Sub-Saharan African, AIDS is the leading cause of death among adult and the region is home to about 64% the world HIV/AIDS suffers, even though the region has small portion of the global population. In three short decades HIV/AIDS has tragically become premier disease of mass destruction. In 2005, 1,320,000 people were living with HIV, 128, 922 people became newly infected with the virus, and 134, 450 people died of HIV-related causes (2).

The precarious economic condition especially the recent price hike and market turmoil is adversely affecting many families and worsening the already severe economic state of the population. This situation is pushing many young girls and women to commercial sex business to make a leaving and win their daily bread. The overall circumstance is putting most women at great risk of HIV infection.

To sum the matter, the situation of most women is harsh and they are at a great risk HIV/AIDS in our country which calls for a concerted effort to address to the problem women's. Women's contribute more than half of the Ethiopian's population and HIV/AIDS intervention would end up unsuccessfully if it doesn't take in to account this major segment of the population(3).

As of now the only way to prevent infection of HIV is to avoid behavior that put at risk of the infection since no vaccine is available for HIV so far. Maintenance of behavior that will protect oneself from the infection or exchange of existing risk behavior to safe behavioral practice will help to avoid the risk of

HIV infection. Many research findings found out that Voluntary Counseling and Testing (VCT) to be indispensable component of HIV prevention and control (4).

Harnessing of VCT with other HIV/AIDS prevention and control programs could play a pivotal role to combat HIV/AIDS. VCT could be communication medium for information about HIV/AIDS and influencing people change their attitude and behavior regarding the disease. VCT can also help raising public awareness of HIV/AIDS, which could be a key factor to halting the spread of HIV/AIDS (4,5).

HIV/AIDS has strong grip on Ethiopia and it's believed that VCT has a potential to break this grip. HCT has an important role in HIV/AIDS prevention and control and reduce HIV transmission. It also facilitates early and appropriate uptake of service for HIV positive individuals and get medical, social and psychological support. To combat the effect of this pandemic reducing or preventing individuals risk behavior is important thus VCT is one of the commonly and widely used intervention mechanism.

Even though there are many HCT programs which are underway by different actors in Ethiopia, USAID Private Sector Program in Ethiopia for TB and HIV also trying to contribute its share in the fight against HIV/AIDS by rendering Mobile HIV Counseling and Testing (MHCT) since 2007. This program, MHCT, is believed to address high risk and mobile segment of the population that would be at great risk of HIV infection. The program is intended to provide quality, affordable and accessible VCT services. The program has conducted mobile HCT in 40 towns of Amhara, Oromia and Afar region which were found out to be high risk corridor and at great risk of HIV infection. The program has addressed more than 69,000 people in the last two years and has envisaged reaching more segment of the high risk group in many corner of the country using the mobile VCT scheme.

Many studies have revealed that large proportions of women are exposed to risk of HIV infection due to a number of factors. Even though there many researches which investigated about women and HIV/AIDS most of them didn’t considered which groups of women are highly affected. Especially major risk factors

that contribute to HIV positive results among women are not explicitly dealt. Moreover, specific behavior and determinants that put women at a great risk of HIV infection are not explored well.

2. Literature Review

2.1 Prevalence of HIV/AIDS in Ethiopia

In Ethiopia the HIV/AIDS has affected and impacted significant portion of the population (6). The HIV/AIDS pandemic has infected more than 1.7 million people and the prevalence rate is estimated to be more than 4.7% with the highest percentage among the age group of 15-49 (7). And AIDS is killing so many adults in the prime of their working lives and affecting the already severe economy of the country. In 2005, an estimated 134,000 Ethiopian died of AIDS and the number of children who have lost one or both parents by AIDS reached to over 4 million. AIDS would reduce the life expectancy at birth of Ethiopians by 4.6 years; increase infant mortality and adult death rates (8).

Even though many HIV/AIDS prevention and control programs were launched, the desired behavioral change is not achieved yet (4). In Ethiopia the level of awareness of the cause and prevention of HIV/AIDS is more spoken of than put in to practice (9). Studies have reveled that large proportions of adults are still to exposed to risky of sexual behavior and practices. In general the missing link so far, which is also much desired to be achieved, is the level of behavior change to keep oneself from the HIV/AIDS (9). This situation calls for a protracted and concerted effort should be channeled using different HIV/AIDS prevention and control programs to combat this merciless disease.

Many research findings indicated that VCT is one of the effective behavioral intervention mechanisms in reducing risk behavior and could help to combat the effect of this pandemic(10,11). Different findings underscore the continued need for education about behaviors that place persons at risk for HIV infection, promotion of HIV counseling and testing

among those who engage in high risk behaviors.(4,12)

2.2 Women and HIV/AIDS

In Ethiopia many people are living with HIV/AIDS and the country is one of the most affected part in the Sub-Saharan Africa region. HIV/AIDS affects people from all walks of life however; many studies show that women are the most vulnerable segment of the population to HIV infection due to various biological and socio-cultural indicators. (2,13)

Like other sub-Saharan countries the HIV prevalence rate of women is higher than that of men (14). Even though HIV infection of female-to-male in rural area is almost equal, urban women are more likely to be infected than urban men. The prevalence of HIV on women age 20-24 is three times more than men of the same age group (6).

Many studies on gender difference in HIV infection also suggest that women are more likely to be infected by the virus than men due to biological factors. Socio-cultural factors like unemployment, illiteracy, extreme poverty and early marriage make women more vulnerable to HIV infection than men (13,15). Due to unstable economic situation of the country the income of most families is inadequate to ensure decent survival of their families. Especially lack of basic items like food are becoming major reasons for women to engage in commercial sex, and thereby exposing more women to HIV infection. (16)

2.3 HIV counseling and testing modalities

Different counseling and testing (CT) service strategies are being used to expand the service delivery system and to promote testing as a more routine practice (4, 17). Expanding the means of service delivery points will help more people to have an access to CT and know their HIV status so that they will be benefited from prevention, care and treatment services (12,18).

The deferent service delivery modalities are intended to reach different target groups and achieve different goals. Some of the goals are providing an entry point to clinical care for those living with HIV/AIDS, strategy to prevent mother-to-child transmission of HIV (PMTCT), and also as an HIV prevention mechanism for the whole population (4, 17, 18).

Counseling and Testing Service modalities include stand-alone, integrated, private sector, mobile and home-based. There is no best approach or model for CT. Each service delivery modality has its own strengths and limitations and should be implemented appropriately to suit the targeted populations and regions. In most cases, the combination of models is appropriate to maximize coverage and improve the accessibility and acceptability of counseling and testing services (4, 12, 17).

The selection of counseling and testing service delivery modal should consider the program goal and the target population group. Is the main goal of the program is to enhance access to care, support and treatment; to provide services to a general population that needs to know their HIV status for both prevention and care; or both(17). In addition to this it is suggested to consider cost, cost-effectiveness, sustainability, affordability, socio-political situation and convenience to the target population (17, 19).

Even though service delivery approaches may differ within and between countries, the suggested public health approach for expanding counseling and testing remains the same: the test is voluntary, the client must give informed consent, the results are kept confidential, the test is accompanied by counseling and the quality of the testing and counseling is ensured (17,20).

2.4 VCT and MHCT

VCT is a professional and confidential relationship between a trained counselor and clients where the clients undergo counseling that help them to make informed decision about HIV/AIDS. This relationship will help clients to understand themselves and their environment and to resolve problems associated with HIV/AIDS, emotional or interpersonal nature (21).

HIV counseling aimed at creating an enabling environment for person to cope with stress and make personal decision related to HIV/AIDS (22). HIV counseling is basic instrument in behavior change, prevention and control of the spread of HIV/AIDS and there is a great need to promote counseling services in Ethiopia to halt the spread of HIV/AIDS (4, 23).

HIV/AIDS counseling service is intended to help individuals or couples to undertake counseling and make an informed choice about being tested for HIV. VCT is one of the HIV prevention and control strategy that focuses on the assessment of HIV risk behavior, provision of information about HIV/AIDS and help clients to develop risk reduction plan (17,22).

VCT is one of the major strategies in HIV/AIDS prevention. It promotes behavioral change or reduction of HIV risk behavior (23, 24, 25). Mobile VCT is found out to be one of the best approaches to reach high risk group and mobile part of the population. There are some portions of the population who are considered to be high risk group by their behavior or the nature of their job. There are also some group of the population who are not comfortable in utilizing static VCT centers for fear of confidentiality and other reasons and this approach would be the best option to address these groups. Thus this special VCT scheme is designed and proved to provide quality, affordable and accessible VCT services to high risk group, mobile part and people who are not satisfied with static VCT option (25, 12).

In general HIV/AIDS counseling can help individuals to have access to HIV testing, promote early knowledge of HIV status and receive HIV prevention counseling to reduce the risk for transmitting or acquiring HIV. It will also help individuals have access to appropriate medical, social and psychosocial support if their serostatus is positive (23).

VCT has been considered as an important entry point for prevention and control of HIV/AIDS. So the output of this research is believed to improve mobile HIV/AIDS Counseling and Testing. Assess MHCT and draw valid conclusion regarding the relevancy of the service for women and recommend a way of improving the quality of the MHCT services.

The rationale behind this study is, thus, to analyze the Determinants of HIV Positive Results among Women's MHCT Clients, the case of USAID Private Sector Program in Ethiopia for TB and HIV.

3. Objective

3.1 General Objective

The general objective of the study is to assess HIV test result and its determinants among female clients attended MHCT service from July, 2007 to November, 2008.

3.2 Specific Objective

1 To determine the HIV status of women HCT clients

2 To assess the association of HIV status with history of sexual behavior, history of STI and socio-demographic factors among women MHCT clients

4. Methodology

4.1 Geographic area

The study has conducted in 40 towns of three regions Amhara (18 towns), Afar (2 towns) Oromiya (20 towns). From Oromya region the study includes Dukem, Bishoftu, Modjo, Adama, Metehara, Wonji, Meki, Arsi Negele, Shashemene, Batu, Hirna, Chiro, Haromaya, Moyale, Kibremengest, Mega, Negele Borena, Yabeleo and Shakiso. From Amhara region Debebirhan, Ataye, shewarobit, kemisie, Bati, Kombolcha, Dessie, Woldiya , Dejen, Bure, Chagni, Gondar, Bahirdar, Metema, Debere Markos, Worta, Este, Debresina and from Afar Logya and Awash Sebat Killo are the towns that are included in the study.

4.2 Study Design

To realize the objective of the present study, a descriptive study of client intake format which is adopted for mobile HIV counseling and testing that implemented by USAID Private Sector Program in Ethiopia for TB and HIV. This method is selected, as it is mainly appropriate to collect a multiplicity of data relating to several variables of the issue under investigation.

4.3 Study Population

The population of the study are women mobile HIV counseling and testing acceptors, who undergone testing from July,2007 to November, 2008. The female clients are invited to the service through different social mobilization strategies and all the clients seek the service voluntarily. There is no any incentive or per-dimes are given for the attendants. This study consider women age 15 and above.

4.4 Sample size

The study included Women who attend Mobile HCT service in 40 towns of the country. This is all women clients who attended the mobile HCT so that the study did not use any sampling method.

4.5 Data collection tools and procedure

The researcher used the client intake format to assess the client's history. The client intake format is a standard tool for recording each HIV counseling and testing session. The format was filled by VCT counselor for each client and has been checked and approved by VCT supervisors. The counselors and the supervisors have got training on how to use and fill the format. The organization which provides the Mobile HIV Counseling and Testing adopted the standard national VCT client intake format to suite its aim and the specific need of mobile VCT. The client intake format is prepared in English but the media of interview is Amharic or oromiffa. The format has 7 parts: Reception, Client Information, Pre-Test Counseling Session, Risk Assessment, TB History, Laboratory Results and Post-Testing Counseling Session. The researcher has made selective use of different parts based on their importance to the research objective. The major dependent variable is test result and the independent variables are age, educational status, Marital status, Employment, Occupation, Previous testing history, sex for money/gift/favor, condom use, Number of casual partner, Number of steady partner and History of STI .

All clients received pre test individual counseling session before they gave a blood sample and sign consent. Blood is drown by the counselor and sent to laboratory technician. After the result a post counseling service is provided. The tests are done by laboratory technician on the site, the testing procedure follow the national algorithm for HIV testing. For screening Determine was

used, Capilus is used for confirmatory test and Uni-gold for tie breaker test. The test has done using a serum. All the three test kits are 100% sensitive and the specificity for Determine is 99.75% and 99.7% both for Capilus and Uni-gold.

4.6 Data Analysis

After coding, the data from the client intake format has analyzed using descriptive statistics method. Bivariate and multivariate analysis has used to measure the association between the variables and control confounding factors. The odds ratio has used to describe the strength of the association. The data entry, coding and processing done by Epi Info and using SPSS 13.0 statistics software.

Quality of dat

4.7 Operational definition

Mobile VCT- temporary VCT site within a town which is going to stay for one or two weeks in one town

Clients – Mobile VCT testers who came to the VCT center voluntarily

Separated – not legally divorced

Divorced – legal termination of marriage

Steady partner – a boy friend, a husband, fiancé

Casual partner – informal or not permanent sexual partner

History of STI - clinically or symptomatically diagnosed STI

4.8 Ethical Consideration

All clients provided informed consent which is witnessed by the counselor and filled and signed after the necessary introduction and explanation is given to the client. Even though the client didn’t give her/his consent for the researcher, the identity of the clients is not disclosed and remains confidential through the whole stage of the research.

5. Result

5.1 Socio Demographic Characteristics

During the period June 2007 – November 2008 PSP – E conducted a mobile VCT service in 40 towns of the country which are found in Afar, Amhara and Oromiya regions. From the total clients tested in the mobile VCT sites about 24,317 clients were female. All the female clients who attended the mobile VCT service and are of age 15 and above were included in this study.

As shown in table 1, the majority of the respondents are found in the age group 15 – 24 (56.2%) and the mean age is 26.3 (±10.0). From all the clients 39.2% never married, 36.2% are married and 12 .4% divorced followed by 5.3% widowed and 4.9 % separated those who are living together and engaged accounted 1.9%.

Client's educational level shows that 30% of the clients are illiterate, those who attain primary and secondary educational level are 29.1% and 32% respectively, and very few clients (5.8 %) had reached to tertiary level of education. More than a quarter of the clients (30.6%) are housewives, the remaining comprised of students (27.5%), unskilled daily laborers (23.1%) and self employed workers (6.6 %) among others.

Table 1 – Percentage distribution of all female clients according Socio – Demographic Characteristic, 40 towns Ethiopia, July 2007 – November 2008

Variable	Response	n	%
Age n= 24317	15 - 19	7371	30.31
	20 - 24	6292	25.87
	25 - 29	3636	14.95
	30 - 34	2113	8.69
	35 - 39	1837	7.55
	40 - 44	1163	4.78
	45 - 49	790	3.25
	50 and Above	1115	4.59
Level of Education n=24,140	Illiterate	7230	29.95
	Able to read	752	3.12
	Primary	7022	29.09
	Secondary	7725	32
	Tertiary	1411	5.85
Marital status n= 24231	Never Married	9493	39.17
	Married	8761	36.15
	Separated	1192	4.92
	Divorced	3027	12.49
	Widowed	1288	5.31
	Living Together	199	0.82
	Engaged	274	1.13
Occupation n= 22,327	Student	6281	28.13
	House wife	6986	31.29
	Unskilled laborers	5266	23.59
	Farmer	377	1.69
	CSW	299	1.34
	Self Employed	1,609	7.2
	Salaried	1146	5.13
	Other	363	1.63
Employment status n =23310	Not employed	13871	59.51
	Employed	9439	40.49

5.2 Sexual behavior

A three fourth of the respondents (73.9 %, n= 17, 567) reported that they ever had sex (sexually active). Frequency of condom use in the last three month is assessed among all sexually active females as never, always and some times. Among all the sexually active clients around 84 % report that they never used condom. About 6.3% of the women uses condom sometimes and only 9.7% reported they always used condom. Only 19.4% of the sexually active clients respond they used condom on the last sex. Sexual behavior indicators, the incidence of having had steady and casual sexual partners were assessed in the past six months of clients contact. The majority of the clients (53.8%) had only one steady partner. Among the clients who respond to the question for number of casual partner in the last six months, 84.4% of them didn't have a casual partner and only 5.1% reported having had 2 or more casual partner. Regarding history of STI only 4.6 % reported had history of STI in their life time. Among the sexually active clients who respond to having had sex for money only 7.1% answered yes.

Table 2- Percentage distributions of sexually active female clients according reported sexual behavior, 40 towns Ethiopia, July 2007 – November 2008

Variable	Response	n	%
Condom last sex	No	14988	86.2
	Yes	2408	19.4
Group Total		17396	
Condom use in last 3mon	Never	12407	84.0
	Some times	938	6.4
	Always	1424	9.6
Group Total		14769	
Sex for money	No	16150	92.9
	yes	1234	7.1
Group Total		17384	
History of STI	No	16538	95.4
	Yes	793	4.6
Group Total		17331	
Steady Partner	0	7946	45.3
	1	9425	53.8
	2 and above	161	0.9
Group Total		17532	
Casual Partner	0	14800	84.4
	1	1841	10.5
	2 and above	891	5.1
Group Total		17532	

5.3 Test Result, Socio-Demographic Characteristics and sexual history for all Female clients

Among the total clients who are tested 91.47% (n=22189) are negative and 8.53 % (n= 2,068) are positive. HIV prevalence is higher among age grouped 30 -34 (15.9%) and 14.62% of those found in age group 25 – 29 are positive. Among all women clients' age groups 25-29 [AOR = 3.1, 2.4 – 4.0] and 30 - 34 [AOR =3.0, 2.3 – 3.9] are at higher risk of HIV infection when compared with those who are at age group of 50 and above. The younger clients aged 15 – 19 had the lowest HIV risk than clients in the older age brackets.

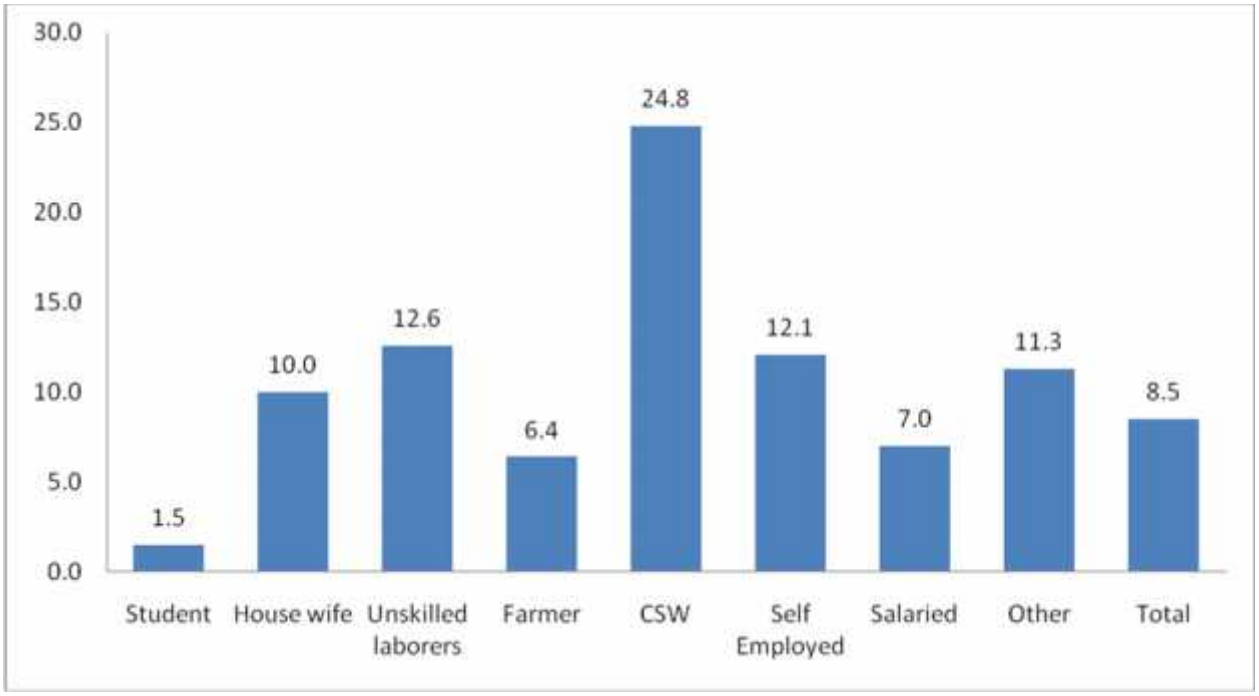
The risk of HIV is highly associated with being Widowed or divorced or separated. The prevalence among widowed clients is 21.2%, followed by divorced (15.6%) and separated(141%). The risk is significantly higher among widowed clients [AOR = 2.9, 2.3 – 3.6] followed by separated [AOR=1.8, 1.4 – 2.2] and divorced [AOR=1.7, 1.4 – 2.1] when compared to never married clients (reference group). The risk is not statistically significant for married, living together and engaged clients.

The highest HIV prevalence is observed among the illiterate clients (12.1%) and the prevalence is low among clients who reached at tertiary level of education (3.0 %). An inverse relationship between the risk of HIV infection and clients' education has also been noted. The odds of being HIV positive among illiterates is 4.5 (3.3, 6.1) higher than those who are at tertiary level, followed by able to read [OR=4.1, 2.8 – 6.0], primary level of education [OR=3.4, 2.5 – 4.7)].

The infection rate among employed clients was 11.6% and from the unemployed clients 6.6 % are infected with HIV. The pick HIV positive infection rate 24.8% is documented among commercial sex workers. The infection rate among the unskilled laborers and the self employed clients (12.6% Vs 12.1%) is almost similar. The lowest HIV infection rate 1.5% was documented

among student and this age group served as a reference category to compare with the other occupation category. Over all the result showed excess HIV risk among clients of different occupation categories compared to the students. The highest and significant HIV risk [AOR= 8.9, 5.8 – 13. 8] is observed among commercial sex workers, followed by self employed [AOR=3.2, 2.2 – 4.6], unskilled daily laborers [AOR=2.8, 2.0 – 4.0]

Figure 1 - HIV prevalence among different occupational groups of female MHCT clients ,40 towns Ethiopia, July 2007 – November 2008



From the total clients HIV infection is higher among clients who never had HIV test before (10.2%). It is analyzed that, an excess risk of infection among clients who are not tested previously [OR = 2.1, 1.8 – 2.3). A higher risk is observed among clients who ever had sex when compared with those never had sex [OR = 2.2, 1.8 – 2.8).

Table 3 – Odds ratio, adjusted odds ratio and 95 % confidence interval of risk factors for HIV infection among Female MHCT clients, 40 towns Ethiopia, July 2007 – November 2008

Variable	Response	HIV test result			
		Negative	Positive	COR(95.0% CI)	AOR (95.0% CI)
Age n = 24257	50 and Above	1011 (91.2)	98(8.8)	1.00	1.00
	15 - 19	7162 (97.4)	189 (2.6)	0.3(0.2-0.4)	0.9 (0.7 – 1.3)
	20 - 24	5802 (92.4)	476 (7.6)	0.8(0.7 – 1.1	1.9(1.4 – 2.5)
	25 - 29	3102 (85.4)	531 (14.6)	1.8(1.4 – 2.2)	3.1(2.4 – 4.0)
	30 - 34	1772 (84.1)	335 (15.9)	2.0(1.5 – 2.5)	3.0 (2.3 – 3.9)
	35 - 39	1591(86.9)	239 (13.1)	1.5 (1.2 – 2.0)	2.3(1.7 – 3.0)
	40 - 44	1039(89.4)	123 (10.6)	1.2(0.9 – 1.6)	1.5(1.1 – 2.1)
	45 - 49	710 (90.2)	77 (9.8)	1.1(0.8 – 1.5)	1.5(1.1 – 2.1)
Marital Status n= 24175	Never Married	9099(96.1)	369(3.9)	1.00	1.00
	Married	7995(91.4)	749(8.6)	2.3 (2.0 – 2.6)	0.9(0.8 – 1.1)
	Separated	10209(85.9)	168(14.1)	4.1(3.3 – 4.9)	1.8(1.4 – 2.2)
	Divorced	2546 (84.4)	472(15.6)	4.6(4.0 – 5.3)	1.7(1.4 – 2.1)
	Widowed	1012(78.8)	272(21.2)	6.6(5.6 – 7.9)	2.9(2.3 – 3.6)
	Living Together	180(90.5)	19(9.5)	2.6(1.6 – 4.2)	1.7(0.9 – 3.0)
	Engaged	260(94.9)	14(5.1)	1.3(0.8 – 2.3)	1.2(0.6 – 2.2)
Level of Education n= 24082	Tertiary	1366(97.0)	42(3.0)	1.00	1.00
	Illiterate	6334(87.9)	870(12.1)	4.5(3.3 – 6.1)	1.8 (1.2 – 2.6)
	Able to read	666(88.8)	84(11.2)	4.1(2.8 – 6.0)	1.8 (1.2 – 2.8)
	Primary	6337(90.4)	6729(9.6)	3.4(2.5 – 4.7)	2.1(1.4 – 3.0)
	Secondary	7331(95.1)	380(4.9)	1.7(1.2 - 2.3)	1.7(1.2 – 2.5
Employment status n= 23251	Not employed	12928(93.4)	910(6.6)	1.00	1.00
	Employed	8317(88.4)	1096(11.6)	1.9(1.7 – 2.1)	1.0(0.8 – 1.3)
Occupation n=22274	Student	6176(98.5)	91(1.5)	1.00	1.00
	House wife	6274(90.0)	700(10.0)	7.6(6.1 – 9.4)	2.6(1.9 – 3.4)
	Unskilled laborers	4588(87.4)	660(12.6)	9.8(7.8 – 12.2)	2.8(2.0 – 4.0)
	Farmer	353(93.6)	24(6.4)	4.6(2.9 – 7.3)	1.2(0.7 – 2.0)
	CSW	224(75.2)	74(24.8)	22.4 (16.0 – 31.3)	8.9(5.8 – 13.8)
	Self Employed	1410(87.9)	195(12.1)	9.4(7.3 – 12.1)	3.2(2.2 – 4.6)
	Salaried	1063(93.3)	80(7.0)	5.1(3.8 – 6.9)	2.3(1.5 – 3.4)
	Other	321(88.7)	41(11.3)	8.7(5.9 – 12.7)	3.0(1.9 – 4.8)
Previous HIV test n = 24095	Yes	8055(94.4)	476 (5.6)	1.00	1.00
	N0	13980(89.8)	1584 (10.2)	1.9(1.7 – 2.1)	2.1(1.8 – 2.3)
Ever had sex n = 23715	No	6038(97.7)	145(2.3)	1.00	1.00
	Yes	15650(89.3)	1882(10.7)	5.0(4.2 – 5.9)	2.2(1.8 – 2.8)

5.4 Test Result, Socio-Demographic Characteristics and sexual behavior for sexually active clients

Among all sexually active female clients, clients who reported that they ever had sex the adjusted odds ratio is computed by considering socio-demographic characteristics, self reported sexual behavior and history of STI (table 4). The overall HIV prevalence among sexually active clients is 10.7%..In these sexually active women age group the high HIV prevalence is observed in age group 30 – 34 (16.2%) and 25 – 29 (15%) . Age groups 30 -34[AOR =3.1], 25 - 29 [AOR=2.8], 35 – 39 [AOR =2.2] are significantly at a higher risk of HIV infection when compared to those who are found at age group 50 and above.

Being widowed divorced or separated are significantly associated with the higher risk of HIV. The odds of being HIV positive is 2.7 times and 1.6 times higher, respectively, widowed and separated clients compared to the never married groups.

The risk of HIV is among clients who are illiterate and those reached at primary level of education is twice of those clients who reached at tertiary level of education followed by clients at secondary level of education [AOR= 1.6, 1.1 – 2.4].

The HIV infection pattern seen across the occupation group for sexually active client's. The highest prevalence is observed among CSW (24.8%), clients who are classified as others (14.7%) and unskilled laborers (14.2). Clients who are classified as others (petty traders, house maids , areke and tella sellers) are at greater risk of HIV[AOR= 2.8, 1.6 – 4.8] followed by Commercial sex workers [AOR= 2.6, 1.6 – 4.4] when compared with their student counter parts. The odds of HIV infection is increased by 5 times among unskilled daily laborers and 4.6 times among self employed women compared to the students.

The infection rate among those reporting having had a steady partner of 2 or more (16.8%) is higher than those who had not have steady partner (13%) but those who had only one steady partner are at less risk when compared with others (8.7 %).Clients who had only one partner have 40% less risk than those clients who don't have a steady partner in the last six months and the risk is higher among clients who reporting having had 2 or more steady partner [OR=1.4, 0.9 – 1.4]. Higher HIV infection rate is observed among clients who reported having had 2 or more casual sexual partner in the last six months (23%) [OR=2.7, 2.3 – 3.2]. There is no association between having had 1 casual partner and HIV infection [OR=1.0, 0.9 - 1.2]. But a chi square trend analysis also shows that a linear trend, as the number of casual partner increases the odds ratio also increase.

Condom use in the last three months and HIV infection was assessed and the prevalence among clients who used condom sometimes is 15.9%, AOR=1.2 (CI, 0.9 – 1.5) when compared with clients who used condom always. But who never used condom are at lesser risk [AOR=0.6, 0.5-0.8]

Among those who had history of STI a quarter of them (25.2%) are HIV positive..The risk of HIV among clients who had history of STI is higher [AOR=1.7, 1.3 – 2.1] when compared to with clients who respond no for history of STI. HIV prevalence among clients who ever had sex for money is 24.6% and also the risk of acquiring HIV is higher among these clients [AOR = 2.2, 1.8 – 2.7]

Table 4 - Odds ratio, adjusted odds ratio and 95 % confidence interval of risk factors for HIV infection among sexually active female MHCT clients, 40 towns Ethiopia, July 2007 – November 2008

		HIV Test Result			
Variable	Response	Negative	Positive	COR (95% CI)	AOR (95% CI)
Age	50 and Above	915(91.0)	90(9.0)	1.00	1.00
n = 17532	15 – 19	3094(95.1)	160(4.9)	0.5(0.4 -0.7)	0.9(0.6 – 1.2)
	20 – 24	4217(90.8)	429(9.2)	1.0(0.8 – 1.3)	1.8(1.2 – 2.4)
	25 – 29	2716(85.0)	480(15.0)	1.8(1.4 – 2.3)	2.8(2.1 – 3.9)
	30 – 34	1663(83.8)	322(16.2)	2.0(1.5 – 2.5)	3.1(2.2 – 4.2)
	35 - 39	1444(86.6)	223(13.4)	1.6(1.2 – 2.0)	2.2(1.6 – 3.0)
	40 – 44	950(89.5)	111(10.5)	1.2(0.9 – 1.6)	1.5(1.1– 2.2)
	45 – 49	651(90.7)	67(9.3)	1.0(0.8 – 1.5)	1.4(0.9– 2.1)
Marital status	Never Married	2684(92.0)	233(8.0)	1.00	1.00
n= 17,532	Married	7995(91.4)	749(8.6)	1.1(0.9 – 1.2)	1.0(0.8 – 1.2)
	Separated	1020(85.9)	168(14.1)	1.9(1.6 – 2.4)	1.6(1.2 – 2.1)
	Divorced	2546 (84.4)	472(15.6)	2.2(1.8 – 2.5)	1.5(1.2 – 1.9)
	Widowed	1012(78.8)	272(21.2)	3.2(2.7 – 3.8)	2.7(2.1 – 3.6)
	Living Together	180(90.5)	19(9.5)	1.2(0.7 – 2.1)	1.4(0.8 – 2.5)
	Engaged	170(93.4)	12(6.6)	0.8(0.4 – 1.5)	0.8(0.4 – 1.6)
Level of Education	Tertiary	765(95.9)	33(4.1)	1.00	1.00
n= 17,416	Illiterate	5669(87.5)	808(12.5)	3.3(2.3 – 4.7)	2.0(1.3 – 3.1)
	Able to read	565(88.0)	77(12.0)	3.2(2.1 – 4.8)	2.1(1.3 – 3.5)
	Primary	4715(88.3)	622(11.7)	3.1(2.1 – 4.4)	2.0(1.4 – 3.1)
	Secondary	3834(92.1)	328(7.9)	2.0(1.4 – 2.9)	1.6(1.1 – 2.4)
Employment	Not employed	8496(91.0)	841(9.0)	1.00	1.00
n = 17014	Employed	6678(87.0)	999(13.0)	1.5(1.4 – 1.7)	1.0(0.8 – 1.4)
Occupation	Student	2056(96.8)	68(3.2)	1.00	1.00
n=16,424	House wife	6274(90.0)	700(10.0)	3.4(2.6 -4.4)	2.5(1.8 – 3.4)
	Unskilled laborers	3657(85.8)	603(14.2)	5.0(3.9 – 6.4)	2.6(1.8 – 3.9)
	Farmer	317(93.5)	22(6.5)	2.1(1.3 – 3.4)	1.3(0.7 – 2.3)
	CSW	224(75.2)	74(24.8)	10.3(7.2 – 14.8)	2.6(1.6 – 4.4)
	Self Employed	1152(86.7)	176(13.3)	4.6(3.5 – 6.2)	2.5(1.7 – 3.9)
	Salaried	787(92.7)	62(7.3)	2.4 (1.7 – 3.4)	1.8(1.1 – 3.0)
	Other	215(85.3)	37(14.7)	5.2(3.4 – 8.0)	2.8(1.6 – 4.8)
Steady Partner	0	6915(87.0)	103(13.0)	1.00	1.00
n=17532	1	8601(91.3)	824(8.7)	0.6(0.6 -0.7)	1.0(0.8 – 1.1)
	2 and above	134(83.2)	27(16.8)	1.4(0.9 – 2.1)	0.8(0.5 – 1.3)
Casual Partner	0	13313(90.0)	1487(10.0)	1.00	1.00
n=17532	1	1651(89.7)	190(10.3)	1.0(0.9 – 1.2)	0.9(0.8 – 1.1)
	2 and above	686(77.0)	205(23.0)	2.7(2.3 – 3.2)	1.3(1.0 – 1.7)
Condom use in last	Always	1221(85.7)	203(14.3)	1.00	1.00
3mon	Never	11236(90.6)	1171(9.4)	0.6(0.5 – 0.7)	0.6(0.5 – 0.8)
n= 14769	Some times	789(84.1)	149(15.9)	1.1(0.9 – 1.4)	1.2(0.9 – 1.5)
Sex for money	No	14584(90.3)	1566(9.7)	1.00	1.00
n= 17384	yes	930(75.4)	304(24.6)	3.0(2.6 – 3.5)	1.7(1.3 – 2.1)
History of STI	No	14891(90.0)	1647(10.0)	1.00	1.00
n= 17331	Yes	593(74.8)	200(25.2)	3.0(2.6 – 3.6)	2.2(1.8 – 2.7)

Limitation

Clients are not random sampling of the general population and as a result the recorded HIV infection rate is subjected to selection bias when extrapolated to the general adult population.

The self reported sexual behaviors , condom use , STI history , number of casual partner are often subjected to social desirability bias and as a result reported behavior do not provide a full account of the problem.

The use of six month recall period may have resulted underestimating the HIV risk level of the study population, since risky behavior occurring more than six months prior to the survey was not assessed.

6. Discussion

Among the total 24,317 female client tested the prevalence is 8.5%. This number is higher when compared to the national women prevalence 4.0%, even higher than the regional women HIV prevalence of the regions where the towns are found (Amhara (5.1%), Oromiya (3.5%) and Afar (2.8%)) according to AIDS in Ethiopia 6th report. In the same report the prevalence among VCT users is markedly higher (15.7%) than the MHCT users but in the six report it is not differentiated for PICT and VCT. In this analysis the prevalence is higher than then the general population this is may be because the target population of the MHCT service is the high risk population groups of the town and also the towns are found at the high risk corridors of the country even though the service is available to the total population. The prevalence finding of this analysis is less than the national point prevalence of the urban areas (9.2%) according to the single point HIV prevalence estimates, but all the towns are not urban areas there are some towns which are semi- urban.

Most of the positive clients are found in the age group of 20 -34. The HIV risk is higher among age group 25 -29 and 30 - 34 these finding goes in line with the DHS 2005 report that the HIV prevalence is directly related with age but in this survey the peak is observed in their middle of 30th not in their late 30th. The younger age group clients are at lesser risk of HIV and also majority of these group are not sexually active. Even the condom use is higher among the sexually active young age group when compared with the other sexually active clients. But the condom use of client's age group 25 and above is very low. In addition to this, the high prevalence of age groups 25 -29 and 30- 34 is may be due to the commutative effect of the past 10 to 15 year's infection (14).

Marital status is one of the factors that determine HIV risk. The HIV risk is higher among the widowed separated and divorced. The risk is higher among the widowed clients followed by separated/divorced the report of the DHS, 2005 identified this group as a risk groups. Another study among workers of two factories in Ethiopia also shows high HIV risk among widows (26). In MHCT clients study, even though the risk is highest among the widowed clients most of them didn't report a casual partner or a steady partner in the last six months but their condom use was very low in the past three months prior to the interview. In spite of this finding the higher risk of HIV infection is may be due to the high mortality rate of AIDS in the country (2). So being widowed is the result of losing their partner because of AIDS, so this high risk is the consequence of the disease. But the separated and the divorced clients reported having had 1 or more casual partner and less condom use, may be this sexual behavior of this group make them at risk.

In this study HIV infection appears to decrease with educational level. Individual with no education have the higher infection rate but as the level of education increases the risk of HIV also decreases, whereas the DHS finding showed that HIV infection rate is directly related with the level of education. But the inverse association between level of education and HIV infection rate is also observed in different studies too (26, 27). This is may be the knowledge about HIV/AIDS is more advanced among those attain the higher level of education and that enables them to practice safer sex and increase condom use negotiation skill (28).

Being an employed or not is the risk factor for HIV those who are not employed are at lesser risk than the employed clients (29). This is may be because of the employed clients are more mobile than the non employed clients. HIV infection is higher among individuals in the highest wealth

quintile, it is high likely to found the employed in highest wealth quintile than the non employed women (30).

The occupation of the clients is one of the determinants factor for HIV infection. The highest infection rate is observed among the commercial sex workers followed by self employed, unskilled daily laborers and others like house maid, petty traders (16). Occupation and level of education is associated with a risky sexual behavior and low access to health care coverage (31)

The Infection is higher in clients who didn't know their status previously than those clients who are tested negative previously. The infection rate among the new testers is twofold than the previously tested clients. It is observed that the prevalence of HIV among new tester is 10.2% whereas among the clients who tested previously only 5.6%. But this finding is contrary to the DHS 2005 report which indicates the HIV prevalence among women who never tested for HIV (2.3%) is lower than the ever tested clients (7.4%). The less prevalence is may be explained by the impact of the VCT. VCT is an entry point to HIV prevention and control activities , clients who passed through VCT service are expected to have a more applicable risk reduction plan and more aware of the preventive strategies than clients who never attended VCT service. And one of the objectives of VCT is to make negative clients to stay negative. (32)

Sexual intercourse is the major means of HIV transmission in Ethiopia (31), in this study clients who ever had sex is at higher risk of infection than those who never had sex. The risk is five times more among the sexually active client than the clients who never had sexual intercourse.

The risk of HIV infection is expected to rise as the number of casual partners increases (30), and high prevalence is observed among those clients who reported two and more casual partner in the last six month. But there is no statistically significant difference between clients reported no

casual partner and one casual partner in the last six months, this is may be due to reported number of casual partner is prone to social desirable bias (27),

A dose – response relationship is noted in number of steady partner and HIV risk, those who have 2 or more steady partner in the last six months are twice risky than those who had only one steady partner. But it is observed that those clients who don't have a steady partner are at more risk than the clients who had only one partner. This is maybe due to these clients are more likely to have a casual partner. Having only one steady partner is a protective factor for HIV infection.

The Highest HIV risk is pointed on clients who used condom sometimes. Those clients who never used condom in the last three month are at lesser risk than clients who always used condom in the last three months prior to the interview. It is documented that consistent and proper use of condom prevents the transmission of HIV (32). When the proportion of clients who never used condom seen most of them are older clients age above 40, house wives and farmers, who do not have casual partner and those who have only one steady partner in the last six months. And clients who respond that they always use condom are those found in the younger age group, the employed, CSW and those who had two or more casual and steady partner(33). When keeping the other variables constant the association between condom use in the last three month and HIV test result is not statistically significant. This may be the shorter period of practice is asked and also most of the clients who never used condom are using the "B" choice in the ABC of HIV prevention strategies. Even though clients respond they use condom always in the last three months their previous practice is not known, in addition to this maybe this answer is subjected to socially desirable and recall bias (34).

Having sex for money is the risk for HIV. Those who responded yes for having had sex for money are at greater risk of HIV. The risk of HIV is markedly higher among those clients who had history of STI (33) .It is observed that having STI increases the risk of HIV infection the presence of STI indicates that the history of having unsafe sex and the infection also increase acquiring the HIV virus (34, 35, 36). According to this study STI increase the risk of HIV infection by three times (37).

This study may not represent the general population because all the clients are not randomly selected from the population they are voluntary visits the mobile counseling and testing service but this study can be comparable with other similar studies . To control the confounding factors a multivariate analysis is done for all variable. And it is observed that some of the answers for the question like number of casual partner, history of STI and condom use are subjected to socially desirable bias and recall bias.

7. Conclusion

HIV infection is determined by socio-demographic factors. The middle age groups widowed/separated/ divorced clients and clients with no or less education are the major determinants. And the risk is observed highly on the clients who are employed. A major risk is observed among commercial sex workers, house maids, petty traders and unskilled daily laborers. Practicing sex for money and history of STI are the major determinants of HIV infection among female clients.

8. Recommendation

The majority of the clients are less educated or illiterates and found in low economic status. The prevention strategies should focus on this segment of the female population. In addition to this targeted behavioral change communication strategies should be developed.

Previous HIV test helps the individual to keep their negative status because it has seen that a wide variation of infection between those who ever test HIV and those never tested for HIV. I recommend that the existing different HIV Counseling and testing modalities should focus to reach key population groups.

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Annex

Annex 1- Client Intake Form